plants it my have become hereditary, i. e., due to internal causes. RAUNKIAER finds in certain plants also that direction of light determines the orientation of the palisade cells; in the great majority, however, their orientation is established independent of this factor.—C. R. B.

Inheritance and gynodioecism.—CORRENS[29] makes a third report on the inheritance of sex in gynodioecious plants, the species dealt with being *Satureia hortensis* and *Silene inflata*, previously reported on, and in addition, *Silene dichotoma* and *Plantago lanceolata*. All of these species confirm the two laws previously derived by the author, namely, that in gynodioecious plants each sex-form produces gametes which have the tendency to produce the same sex-form, and that the phylogenetically newer unisexual form dominates more or less completely the older bisexual form. There seems to be a third class in the case of *Plantago lanceolata*, characterized by an intermediate condition. These are described as gynomonoecious or as stunted bisexual. The offspring of these contained 28–32 per cent. ♀, as compared with 0–3 per cent. among the offspring of normal bisexual parents, and 71–96 per cent. among the progeny of fully pistillate individuals.—G. H. SHULL.

Commercial forage seeds.—The adulteration of commercial forage seeds has become a question of great importance in the western agricultural regions, and reliable, easily applied distinctions between the adulterants and the genuine seed are being sought for energetically at the Agricultural Experiment Stations. Two recent bulletins from Kansas deal with two of the most important forage crops, namely alfalfa[30] and blue grass.[31] To recognize without fail the commercial seed of alfalfa is to protect one of the largest financial interests of the region. In the case of the distinction between the grains of *Poa pratensis* and *Poa compressa*, it is interesting to note that these observers have discovered what seems to be an unfailing character in the toothing of the palet, which agrostologists have overlooked.—J. M. C.

Progress of accretion during growth.—As stated by HEDLUND,[32] it is important to ascertain the amount or rather the rate of accretion correlated with internal processes of the protoplasm during growth. This author has made a quantitative study which is certainly a step in advance. He finds that a single cell (alga) grows more rapidly when free than when in contact with a neighbor. Growth declines for a period before division and remains slow while the protoplasm is

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[29] CORRENS, C., Die Vererbung der Geschlechtsformen bei den gynodiöcischen Pflanzen. Ber. Deutsch. Bot. Gesells. **24**:459–474. 1906.

[30] ROBERTS, H. F., and FREEMAN, G. F., Alfalfa seed; its adulterants, substitutes, and impurities, and their detection. Kans. Agric. Coll. Bull. 133. 1906.

[31] ———, Commercial seeds of brome grass and of English and Kentucky blue grasses; adulterants and substitutes and their detection. Kans. Agric. Coll. Bull. 141. 1907.

[32] HEDLUND, T., Ueber den Zuwachsverlauf bei kugeligen Algen während des Wachstums. Bot. Stud. tillägn. F. R. KJELLMAN 35–54. *pls.* 4. Upsala, 1906.

engaged in division. The figures support what the author regards as a general law, that the rate of accretion varies inversely with the size of the organism. There is nothing particularly new about that, but there is value in abundant data.—RAYMOND H. POND.

Mechanics of plants.—LORCH describes the arrangement of mechanical tissues in a number of mosses and the warping effects produced thereby in absorbing or losing water.[33] His observations upon the circinate inrolling of *Leptodon Smithii* and some allies, and the behavior of leaves possessing mechanical tissues in ribs and borders, as the Polytrichaceae, are interesting, but develop nothing specially novel. The same may be said of the study of the mechanical system of the hyaline cells in Sphagnum leaves.[34]—C. R. B.

Respiration.—A rather startling announcement is that by STOKLASA[35] and his assistants that in coal and lignite they find an enzyme, peroxidase; and by comparative experiments on sterilized and non-sterilized coals, following the methods of PALLADIN and his pupils, they recognize the excretion of CO_2 as dependent partly upon autoxidation and partly upon enzymic action. The excretion of methane and hydrogen is due to the peroxidase.—C. R. B.

Secretions of enzymes.—PANTANELLI has continued his study of this topic, of which he presents a detailed account.[36] Though he has recorded the effect of many substances upon the formation and action of invertase in Mucor, he has not been able to throw much light upon the deeper problem of the method of secretion.—C. R. B.

Physiology of movement.—The *New Phytologist* is printing an interesting series of lectures on this subject by Mr. FRANCIS DARWIN, beginning in the number for November 1906.[37]—C. R. B.

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33 LORCH, WM., Einige Bewegungs- und Schrumfungserscheinungen an den Achsen und Blättern mehrerer Laubmoose als Folge des Verlustes von Wasser. Flora **97**:76–95. *figs. 20.* 1907.

34 ———, Das mechanische System der Blätter, insbesondere der Stämmchenblätter von Sphagnum. *Idem* **97**:96–106. *figs. 11.*

35 STOKLASA, J., A. ERNST and K. CHOCENSKÝ, Ueber die anaërobe Atmung der Samenpflanzen und die Isolierung der Atmungsenzyme. II. Ber. Deutsch. Bot. Gesells. **25**:38–42. 1907.

36 PANTANELLI, E., Meccanismo di secrezione degli enzimi. Annali di Bot. **5**:229–272, 355–416, 1906.

37 I. Associated stimuli. Nov. 1906. II. On some questions of nomenclature and method. Dec. 1906. III. The analysis of geotropism. Jan. 1907. IV. The localisation of perception. Feb. 1907.